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inasmuch as sudden or sport variations are exceedingly rare while slight variations are exceedingly common, does it not follow that the vast majority of species must originate from slight variations? My argument is not that species of plants may not in rare cases arise by the perpetuation of sport characters, as de Vries believes they do, but admitting this, my contention is that the overwhelming majority of plants, and so far as known all animals, originate in the generally recognized way, by the gradual development of minute variations. The theory of the origin of species by mutation, therefore, far from being a great principle in biology, as some seem to believe, appears to be one of a hundred minor factors to be considered in rare cases as a possible explanation of the origin of particular species of plants, but so far as known not applicable in the case of animals.

C. HART MERRIAM.

U. S. BIOLOGICAL SURVEY.

SECTION F—ZOOLOGY.

SECTION F was organized at the New Orleans meeting with the following officers:

Vice-President—Henry B. Ward, Lincoln, Nebr.

Secretary—C. Judson Herrick, Granville, Ohio.

Councilor—Herbert Osborn.

Member of General Committee—B. L. Seawell.

Press Secretary—C. Judson Herrick.

Sectional Committee—C. H. Merriam, Vice-president, 1905; Henry B. Ward, Vice-president, 1906; C. Judson Herrick, Secretary, 1905-6; C. H. Eigenmann, for one year; Henry B. Ward, for two years; Frank Smith, for three years; W. E. Ritter, for four years; A. M. Bleile, for five years.

On the afternoon of December 29 the vice-president's address was delivered by C. H. Merriam, on the subject, 'Is Mutation a Factor in the Evolution of the Higher Vertebrates?' The section met for the reading of papers on December 30, and joint sessions were held on January 1 with the Section of Physiology and Experi-

mental Medicine, and on January 2 with the Association of Economic Entomologists. The following papers were read before the section:

Preliminary Observations on the Variation of Utethesia venusta, Dalman: MEL.

T. COOK, Santiago de las Vegas, Cuba.

The literature recognizes three species (*U. bella*, *U. venusta* and *U. ornatix*) and three varieties (*hybrida*, *terminalis* and *stretchii*) of this genus. These species cover a very wide range. The distinctive characters are primarily color characters. After examining a large number of specimens, many of which were reared in captivity, the writer concludes that intergradations are such as to reduce these three species and three varieties to one species.

Filaria loa, a Study on the Dispersal of Parasites: HENRY B. WARD, University of Nebraska.

Of the African eye worm (*Filaria loa*) the author has recently published a list of 86 old and 8 new cases. The first six cases on record were from the West Indies, as also twelve in the first 21. But since 1845 no cases have been recorded there, its introduction having ceased with the cessation of the slave trade. All cases were in negroes and most had recently come from West Africa. Five cases reported from France all originated in the French Congo, as also cases from Switzerland and Belgium. One specimen removed in Germany came from Kamerun, and five in England from Old Calabar.

Eight cases in North America since 1890 were all in missionaries and all but one came from Kamerun. Thus all extra-African cases are distinctly traceable to a known or a possible infection in the western part of that continent where the parasite is endemic. Here the review of cases indicates clearly that the parasite is distributed over the entire coast from about

5° north of the equator to at least 10° south, and various observers say that in certain regions nearly every inhabitant suffers from it. This is recorded for the Ogowé River by Miss Mary Kingsley, the well-known African traveler.

How far it may penetrate into the interior of the continent is as yet unknown. Certain it is, however, that cases occur more than 120 miles from the coast, while a recent paper records its presence in a post-mortem made in Kassai, approximately 600 miles from the coast on one of the chief tributaries of the Congo.

The occurrence of *Filaria loa* in negro slaves, in travelers, in government officials and in missionaries points out distinctly the certainty with which any kind of intercourse between nations and geographic areas tends to transfer to new races and territories the diseases of the old. Increased means of communication and growing freedom of movement contribute clearly to the spread of maladies and call for better means to check their advance into new regions. It is not to be doubted that some of the persons who brought *F. loa* into the United States now harbor its embryos in the blood. Though we know nothing precise of its life history, the possibility lies close at hand that some blood-sucking insect may furnish these embryos proper conditions for further development and may thus bring about the introduction of a new disease into our territory. Such cases as these of *F. loa* show clearly the gradual spread of disease through national intercourse.

A New Bothriocephalid Parasite of Man:
HENRY B. WARD, University of Nebraska.

The specimens were obtained from a child six years of age, born and brought up in the prairie region. The report of the mother that the child had been found some months ago chewing a piece of raw

fish probably serves to explain the mode of infection. The specimens do not belong to the common bothriocephalid found in man (*Dibothriocephalus latus*), but to another species apparently undescribed as yet. A complete account of the anatomy of the species will be published later, together with a discussion of its relationship.

An American Species of Lumbriculus
Grube: FRANK SMITH, University of Illinois.

The species, *Lumbriculus variegatus* (Müller) is the best known representative of the family Lumbriculidæ and is the only recognized member of its genus. It has thus far been found only in Europe. Recent papers by Wenig and Hesse have extended our knowledge of the reproductive organs of that species and have lessened the supposed differences between it and *Thinodrilus inconstans* Smith, described in 1895 from Illinois specimens. After a further study of these specimens, the writer is convinced that the Illinois specimens should be included in the genus *Lumbriculus*. The details of structure and comparison on which this conclusion is based appear in the paper which will soon be published in the Bulletin of the Illinois State Laboratory of Natural History.

A Mendelian Character in Cattle: W. J. SPILLMAN, U. S. Department of Agriculture.

The data presented indicate that in crosses between polled and horned cattle the inheritance of the horn-producing character is in accordance with Mendel's well-known law of segregation of character pairs. The paper was based on the progeny of seven polled bulls bred to horned cows. The polled character is dominant, though the hybrids frequently have 'scurs'—imperfectly developed horns.

The Activity of the White Rat at Different Ages: JAMES ROLLIN SLONAKER, Stanford University.

Three preliminary experiments have been carried on and others are in progress to determine the normal daily activity of the white rat from birth to natural death due to old age. The rate of growth as determined by weight and the daily activity as determined by the number of revolutions of revolving cages are carefully recorded and tabulated. From the preliminary experiments the following conclusions may be drawn:

1. A marked difference in daily activity is noticed in rats of different ages.

2. The very young rat and the old rat are each noticeably inactive.

3. The period of greatest activity appears to be when the rat has reached the age of 100 days. At this age the weight is but little more than half that of the adult.

4. The period of daily activity occurs almost wholly during the night-time. They show little or no activity during the day-time. This, I think, is due mainly to the anatomical structure of the eye and to inherited tendencies.

5. The curve of activity rises gradually until the rats have reached about the age of forty or fifty days, after which there is a very rapid ascent.

6. Great individual variations are manifested, which necessitate experimenting on a larger number of individuals.

7. Owing to the premature termination of these preliminary experiments, a curve representing the activity from birth to death due to old age could not be constructed. Experiments now in progress will furnish the data for such a curve.

The Physiological Effects of Changes in Water Density and Salinity on Fishes: F. B. SUMNER, College of the City of New York.

The Poison Glands of Noturus and Schilbeodes: H. D. REED, Cornell University.

The Osteology and Relationships of the Percopsidæ: H. D. REED, Cornell University.

Descriptions of a New Genus and Nine New Species of Sphæromidæ: HARRIET RICHARDSON, Smithsonian Institution.

In this paper a number of new species belonging to several well-known genera are described, and diagnoses of genera heretofore established are more fully drawn up, together with the definition of a new genus, *Cassidias*. The species described come from off Cape St. Roque, Brazil; off Rio de la Plata, Argentine Republic; from Hakodate Bay, Japan, and Cape Town, Africa. The types of all are in the collection of the U. S. National Museum. A few remarks are offered in regard to the species of the genus *Tecticeps* and both *T. alascensis* and *T. convexus* are redescribed and additional figures given.

The Embryology of Corymorpha: HARRY BEAL TORREY, University of California.

Fertilization is external; the eggs are amoeboid until fertilized. Cleavage is approximately equal. The gastrula cavity is formed between the cells of a solid endodermic mass of planula. The latter is never ciliated and has no free-swimming stage, but may creep slowly. The hydranth is formed by a transformation of the distal half of the embryo; the axes of the tentacles arise from cells pushed out from the epithelial endoderm. Rootlets appear similarly. Tentacles arise according to a modified quartet plan governed probably in large measure by mechanical conditions. Cœnosarcal canals, numerous in the adult, are derived from a single larval cavity by ingrowth and enlargement of epithelial endoderm cells. Morphallaxis plays an important rôle in development.

The Relation between the Nerves of Taste and Touch in Fishes: C. JUDSON HERRICK, Denison University.

It has been shown that certain teleosts, notably catfish and carp, are provided with taste buds freely distributed in the outer skin, that the fishes taste with these organs and habitually localize their food by the combined action of cutaneous organs of touch and taste. Inasmuch as these sense organs belong to totally distinct systems (somatic and visceral, respectively) whose peripheral nerves and primary cerebral centers are wholly unrelated, considerable interest attaches to the question of the central relations of the tactile and gustatory systems of neurones with one another. The gustatory reflex paths within the brains of these fishes have been fully worked out, and the present paper reports the discovery of a broad and complex area of correlation with the tactile centers, in the funicular nuclei at the lower end of the medulla oblongata.

The Problem of Wing Origin and its Significance in Insect Phylogeny: HERBERT OSBORN, Ohio State University.

The origin of the insect wing is a difficult problem to solve, since on account of its antiquity the evidence, both morphological and developmental, is much obscured. Fossil forms show the occurrence of winged insects as far back as the Paleozoic, and the structure must, of course, have arisen at some time prior to or during that period. The reduction of types of venation to a common form indicates a common origin for wings of all orders, and the inclusion of tracheae suggests a respiratory function. A respiratory function indicates aquatic life in the ancestral form, a suggestion which is corroborated by the method of musculature and the development so far as it can be traced. That they are not to be associated with any existing forms of aquatic insects is believed

to be shown by the secondary character of aquatic adaptation of modern orders. The explanation of aquatic origin becomes conceivable, however, if we assume a primitive tracheate form, perhaps peripatoid in character, which became adapted to aquatic life before or during Paleozoic time, this primitive aquatic form returning to terrestrial habit and the tracheated respiratory gills being modified to wings. Of the existing orders then arising, some have become in part or quite entirely aquatic by adaptation in more recent time. Diagrams indicating the appearance of the different orders of insects in time and their lines of derivation as suggested by this conception of the evolution of the Pterygota were shown.

C. JUDSON HERRICK,
Secretary.

SCIENTIFIC BOOKS.

The Elements of Psychology. By EDWARD L. THORNDIKE. Pp. xix + 351. New York, A. G. Seiler. 1905.

Hardly a year passes now-a-days without the appearance of several new text-books of psychology. One's first impression in noting this fact is that there must be as yet in this still youthful science comparatively little agreement among its individual expositors as to the body of facts to be presented, or as to the laws which account for the existence of the facts, or as to the best manner of presentation. Professor James, indeed, in a justifiably laudatory introduction to this book by Thorndike, maintains that these many text-books "so far as students go, are practical equivalents for each other. * * * The differences in them are largely of order and emphasis, or of fondness on the authors' parts for certain phrases, or for their own method of approach to particular questions. It is one and the same body of facts with which they all make us acquainted." This is certainly true. There is a large body of facts with respect to which there is general agreement. Yet after all, the mere presentation of facts